# Schulterarthroskopie

## Chirurgische Behandlung von Rotatorenmanschettenläsionen

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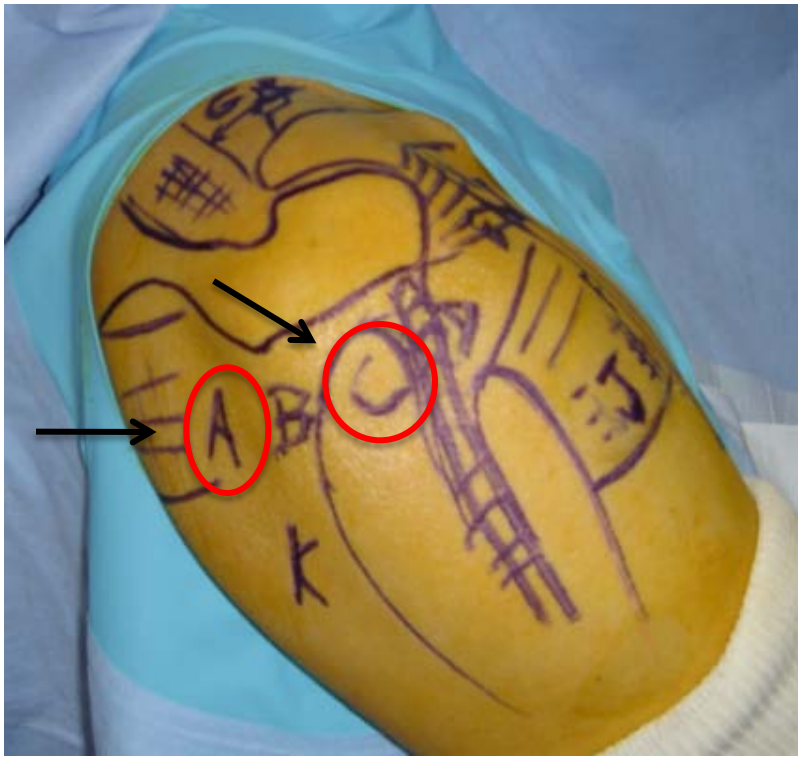
Donauspital

# Rotatorenmanschettenruptur

- Prävalenz nimmt mit dem Alter zu
  - 40-49 Jährige: 11%
  - 50-59 Jährige: 33%
  - 60-69 Jährige: 55%
  - 70-79 Jährige: 70%
- Ätiologie:
  - extrinsische Faktoren (Outlet Impingement)
  - intrinsische Faktoren (Enthesiopathie, hypovaskuläre Zone ca. 0,5 – 1 cm prox. des Sehnenansatzes)
  - traumatisch

# Entrance Portals

- A Portal – posterior cuff intact, small to medium tear
- C Portal – submassive to massive cuff tear



# Diagnostischer Rundgang

## Glenohumeralgelenk

1. LBS + superiores Labrum
2. M. subscapularis – Innenrotation!
3. Pulley, CHL, SGHL
4. Supraspinatus,Infraspinatus, Teres minor, Rotatorenkabel
5. Recessus axillaris, inf. HAGL Läsion? freier GK?
6. posteriores Labrum
7. anteriores Labrum
8. vorderer Kapsel und Ligamente
9. ggf. posteriore Kapsel – 2. Portal

# Diagnostischer Rundgang
## Subacromial

1. Acromionunterfläche – Outletimpingement?
2. Lig. coracoacromiale
3. Bursa subacromialis
4. Rotatorenmanschettenoberfläche
5. AC-Gelenk

# Normalbefunde und Variationen

- sublabrales Foramen
  - 1 – 3 Uhr Position
- Meniskoides Labrum
- GH-Ligamenttypen nach Morgan
  - Typ I: Alle Bänder unterscheidbar, Rezessus dazwischen
  - Typ II: MGHL und IGHL verlaufen gemeinsam
  - Typ III: MGHL ist cord-like, Labrum vorhanden, ev. sublabrales Foramen
  - Typ IV: Ligamente nicht erkennbar – v.a. in hyperlaxen Schultern
  - Typ V: Buford Komplex: Cord like MGHL, no Labrum (Labrum beginnt erst in der Mitte des Glenoidrandes)

# Normalbefunde und Variationen

## Glenoid + Humerus + RM

Glenoid:

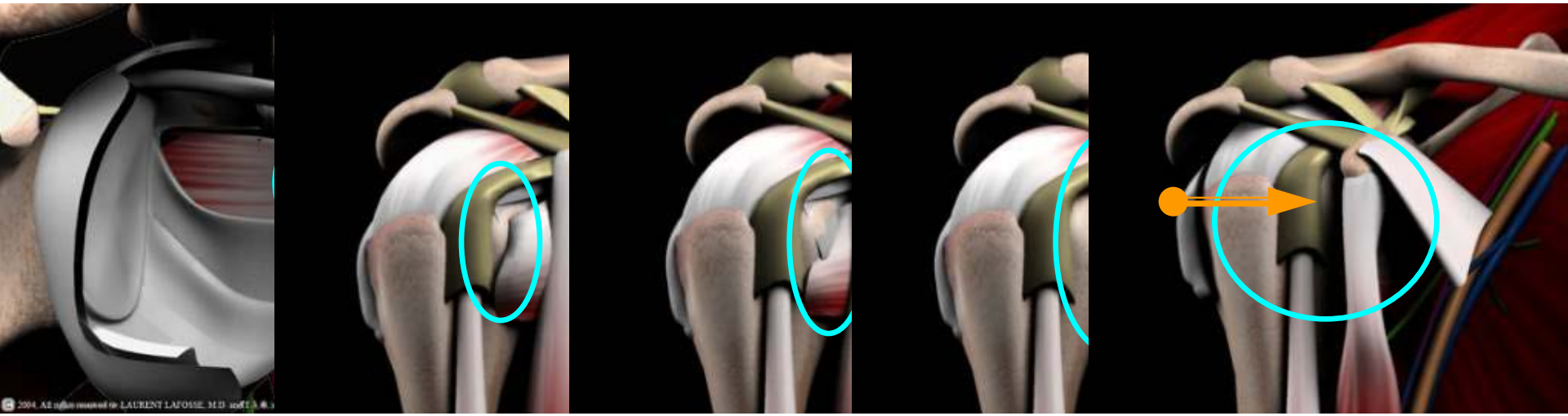
- birnenförmig
- Knorpel zentral dünner – KEINE Chondromalazie

Humerus

- bare area
  - posterolateral fehlender Knorpelüberzug
- Rotatorenmanschette
- Rotatorenkabel
  - Fasciculus obliquus = Hängebrückenphänomen
- Crescent Zone
  - halbmondförmiger  Bereich distal des Kabels

# Patholgische Befunde

# Subscapularisehnenläsionen



Typ I: Partialschäden oberes Drittel
Typ II: Ruptur des oberen Drittels
Typ III: Ruptur 50%
Typ IV: komplette Ruptur, Kopf zentriert, Goutallier < 3°
Typ V: : komplette Ruptur, Kopf dezentriert, Goutallier > 3°

# Pulleyläsionen

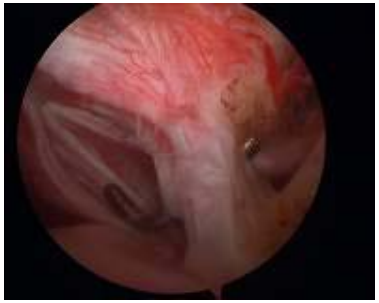
Habermeyer Klassifikation

- Typ I: isolierte Läsion SGHL
- Typ II: Läsion SGHL + SSP artikulär, partiell
- Typ III: Läsion SGHL + SSC, partiell und artikulär
- Typ IV: Läsion SGHL + SSP + SSC partiell, artikulär

**CAVE:**

- Hinter einer medialen Pulley-Läsion verbirgt sich meistens eine SSC Ruptur!



# Supraspinatussehnenläsion

## partiell – artikulär/bursaseitig

| Location of Tears | |
|---|---|
| A<br>B | Articular side<br>Bursal Surface |
| Severity of Tear | |
| 0 | Normal cuff with, with smooth coverings of synovium and bursa |
| I | Minimal superficial bursal or synovial irritation or slight capsular fraying in a small localized area usually < 1cm |
| II | Actual fraying and failure of some rotator cuff fibers in addition to synovial bursal or capsular injury usually < 2 cm |
| III | More severe rotator cuff injury including fraying and fragmentation of tendon fiber often involving the whole the whole surface of a cuff tendon (most often the supraspinatus usually < 3 cm |
| IV | Very severe partial rotator cuff tear that usually contains in addition to fraying and fragmentation of tendon tissue a sizable flap tear and often encompasses more than a single tendon |

Typ IV = PASTA Lesion = partial articular SSP tendon avulsion

C = complete tears

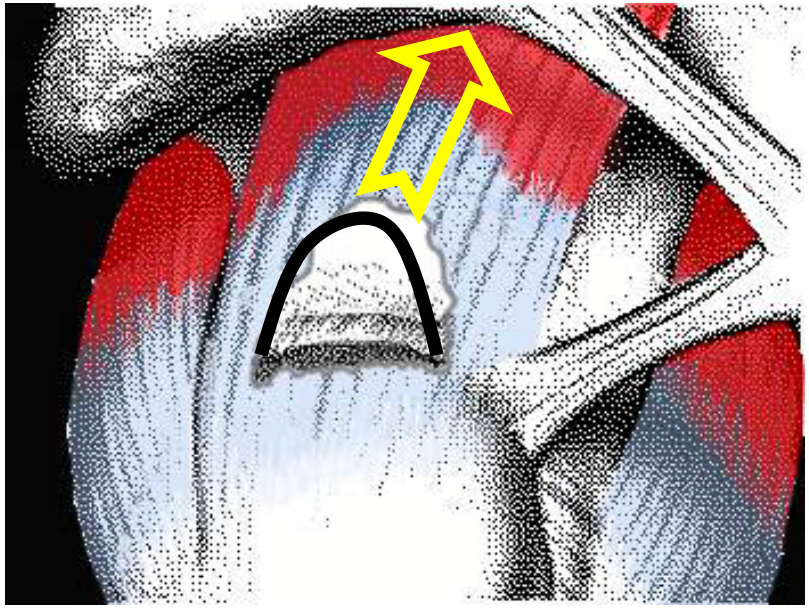
# Komplettrupturen

- Unterscheidung nach ihrer Form
  - L - shape
  - reversed L - shape
  - U - shape
  - V - shape
- Unterscheidung nach ihrer Ausdehnung (Snyder)
  - C I: wie eine Stichwunde
  - C II: < 2cm, 1 Sehne, ohne Retraktion
  - C III: 3-4 cm, geringe Retraktion
  - C IV: Massenläsion von min. 2 Sehnen

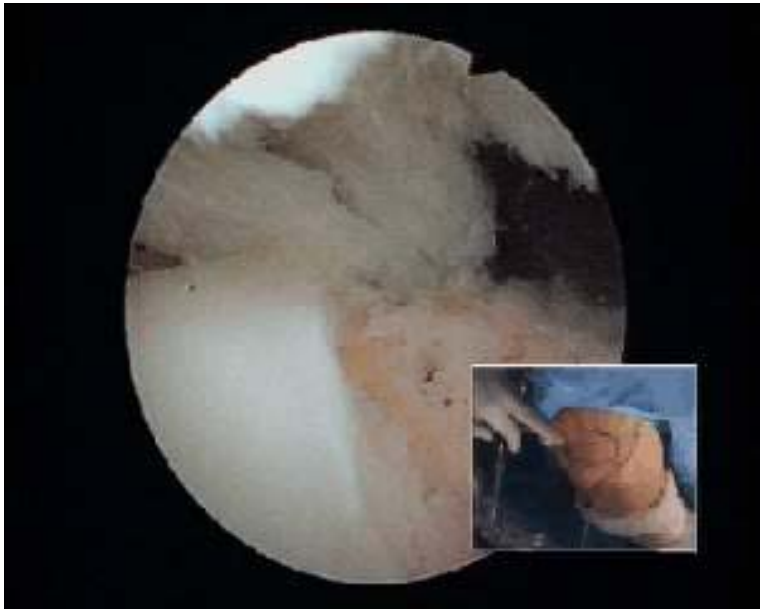
# Komplettrupturen

- Unterscheidung nach ihrer Retraktion (Patte)
  - Typ I: Retraktion nahe der knöchernen Insertion
  - Typ II: Retraktion Mitte Humeruskopf
  - Typ III: Retraktion auf Glenoidhöhe

# SHAPE of the TENDON LESION
# + MUSCLE CONTRACTION
# = DIRECTION of RETRACTION

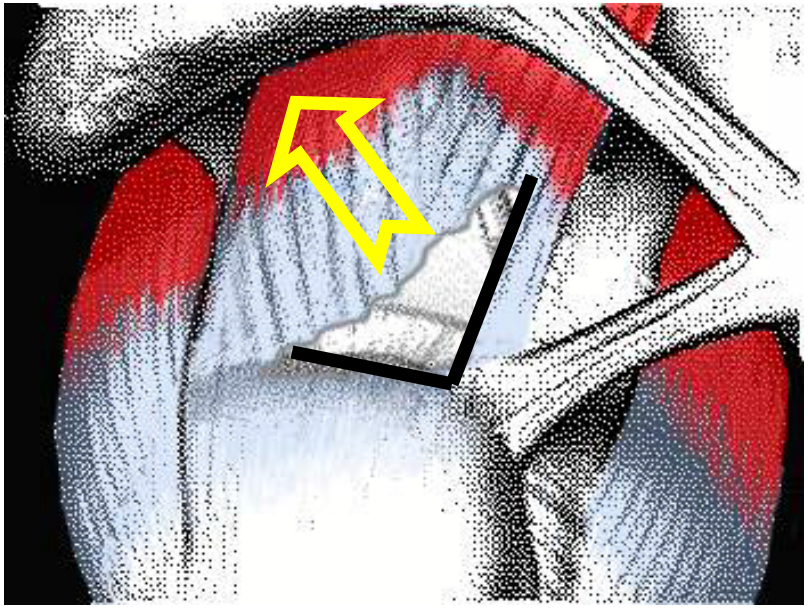


U SHAPE

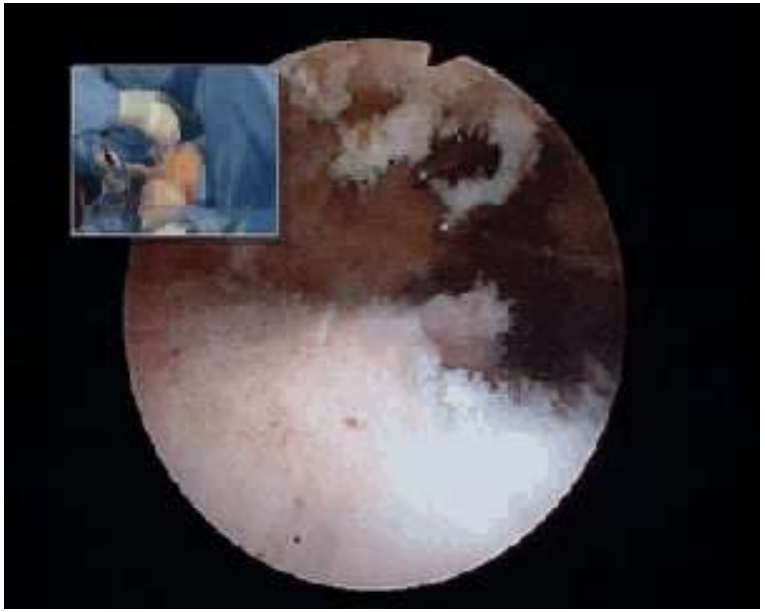


MEDIAL RETRACTION

# SHAPE of the TENDON LESION
# + MUSCLE CONTRACTION
# = DIRECTION of RETRACTION

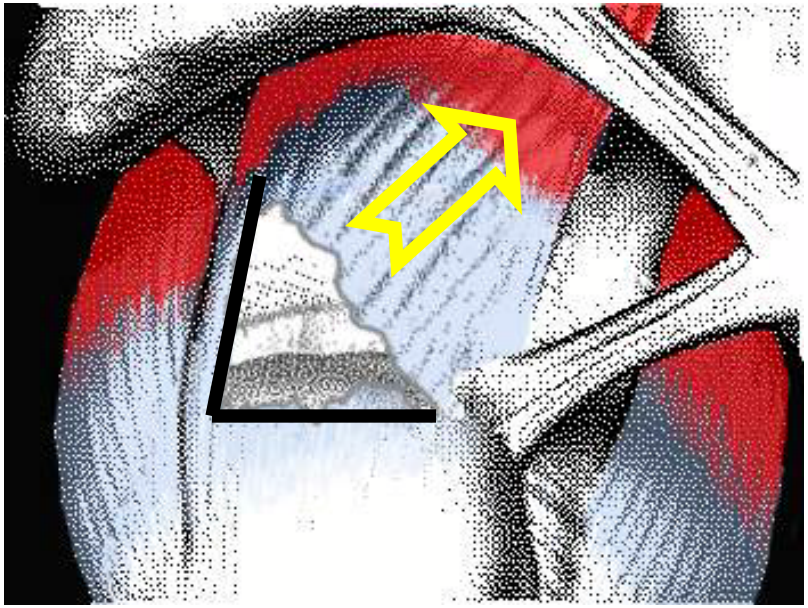


ANT L SHAPE



POST RETRACTION

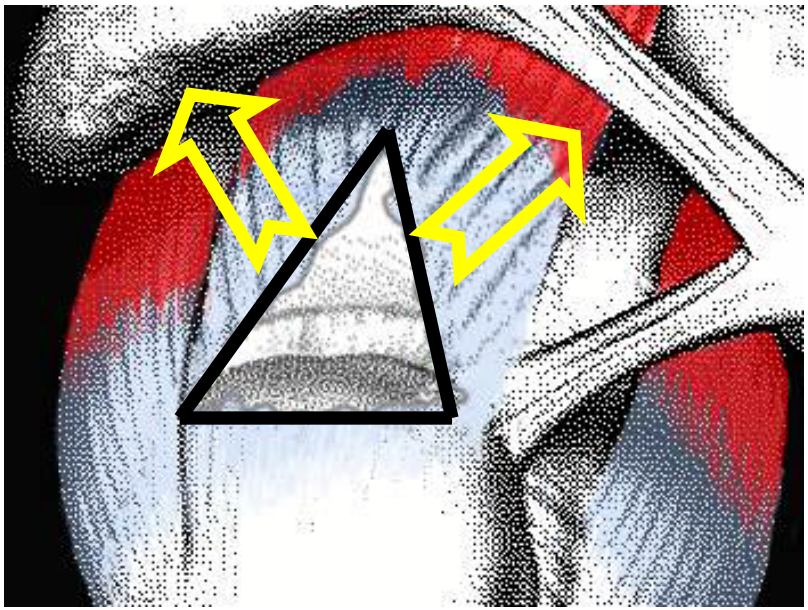
# SHAPE of the TENDON LESION
# + MUSCLE CONTRACTION
# = DIRECTION of RETRACTION



POST L SHAPE

ANT RETRACTION

# SHAPE of the TENDON LESION
# + MUSCLE CONTRACTION
# = DIRECTION of RETRACTION



V SHAPE

ANT+POST RETRACTION


Technik

Literatur Review - Single Row (SR) versus Double Row (DR)

# Anatomy

- SR was **similar** to DR in **gap formation** and **load to failure**,
  **DR** restored a **larger footprint**
  *Mazzoca et al., Am J Sports Med 2005*

- **DR** repair offered over **twice** the footprint **coverage**
  *Brady et al., Arthroscopy 2006*

- Double row fixation may result in **improved structural healing**, ...,
  depending on the size of the tear.
  *Saridakis and Jones, JBJS Am 2010*

Literatur ReviewSingle Row (SR) versus Double Row (DR) -

# Biomechanics

- ...in **DR** repair, stress concentration was observed only around the **medial anchor**...,

  ...both SR and DR showed **higher stress concentration inside the tendon** than did transosseous sut ure fixation.

  *Sano et al. Am J Sports Med 2007*

- **DR** repair did **not show a biomechanical advantage** in a bovine model

  *Mahar et al., Arthroscopy 2007*

- The **increased load to failure** at eight weeks seemed to be related to the **increase of the surface area** of healed tendon-to-bone in the DR repair group. (experimental study in rabbits)

  *Ozbaydar et al., JBJS Br. 2008*

Literatur ReviewSingle Row (SR) versus Double Row (DR)

# Results

- At 2 year follow up **no significant difference** in clinical outcome
  (Level of evidence: **Level I** )
  Grasso et al., Arthroscopy 2009

- Arthroscopic rotator cuff repairs with DR show **no significant difference** compared with SR in clinical outcome **at 1 year follow up**
  (Level of evidence: Level II, **systematic review** of Level I + II studies)
  *Wall et al., Arthroscopy 2009*

- In conclusion, we found significantly **lower retear rates** for double-row repairs when compared with single-row repairs for all tears greater than 1 cm.
  *Duquin et al., Am J Sports Med 2010*

Conclusion : No consensus

=> for us the aim of the repair is

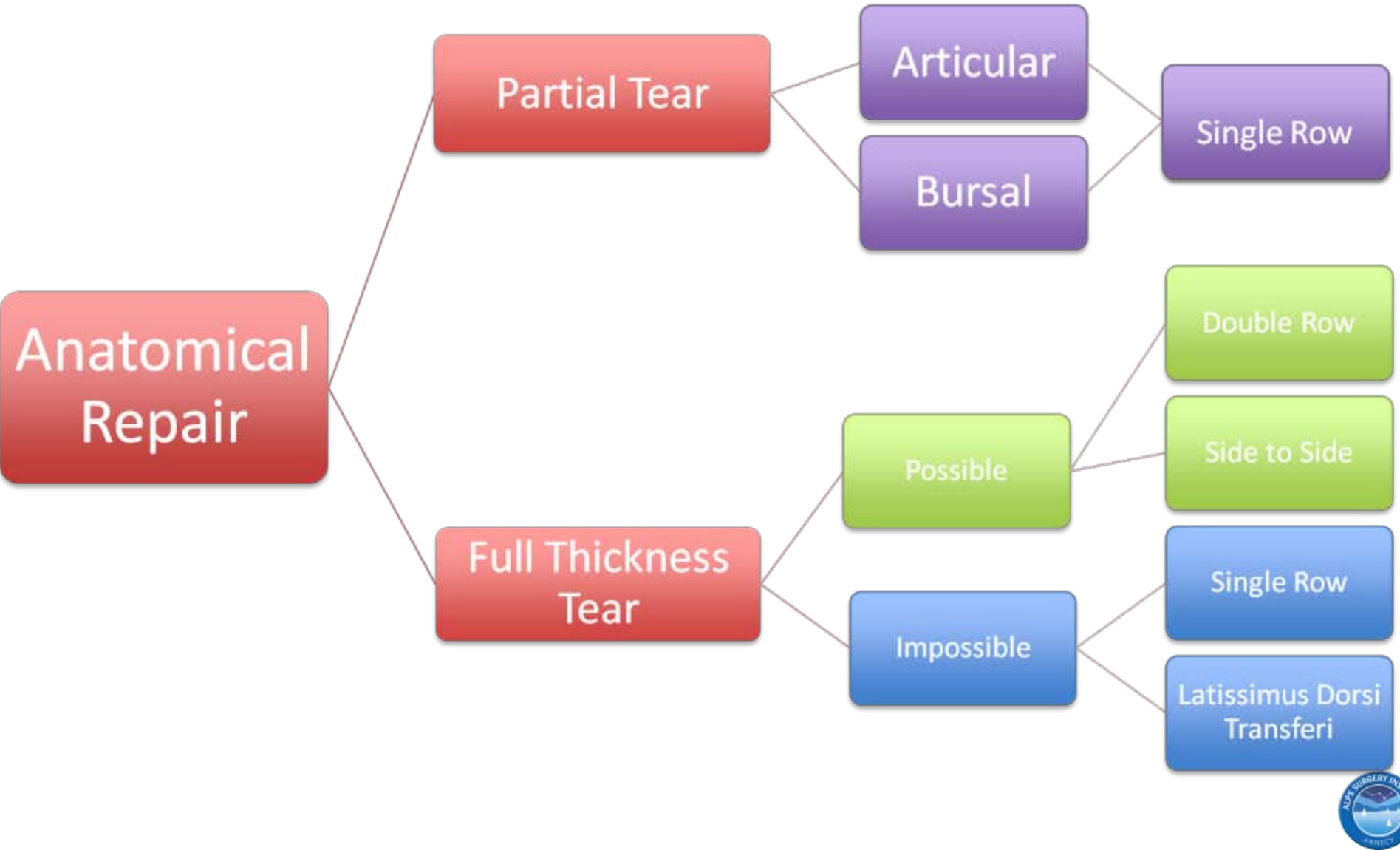
- **RESTORE THE ANATOMY**

**As much as possible**

**By adapted technique**

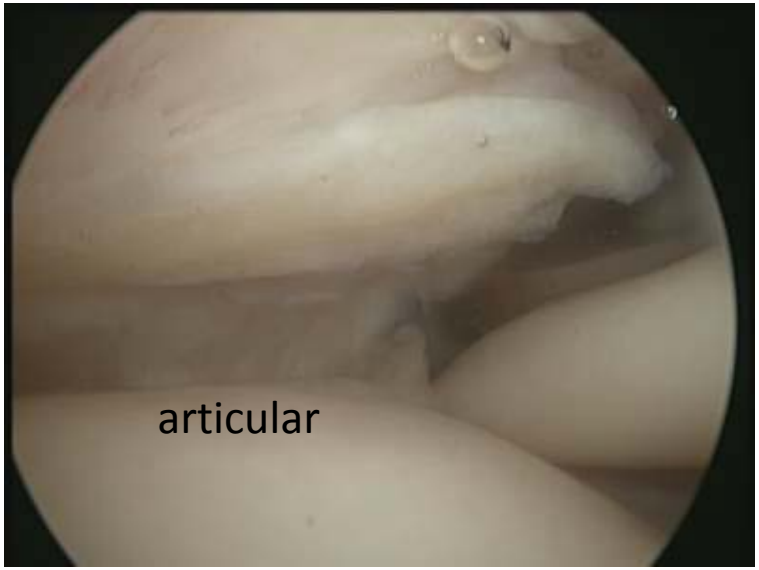
- If it is not possible do a partial repair.

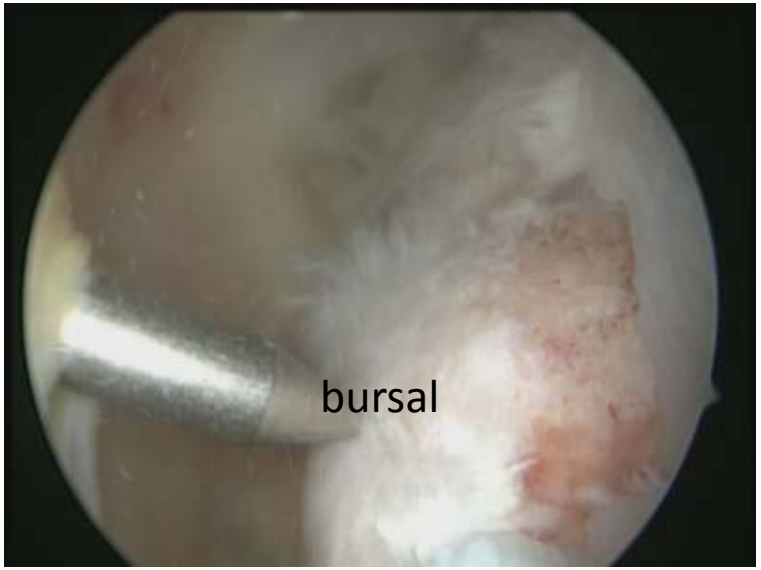
# Arthroscopic Assessment



# Arthroscopic Assessment

- Partial Rotator Cuff Tear



# Technique
# Single Row – Articular Side

video

# Technique
# Single Row – Bursal Side

video

# Full Thickness Rotator Cuff Tear

- video

# Technik Release

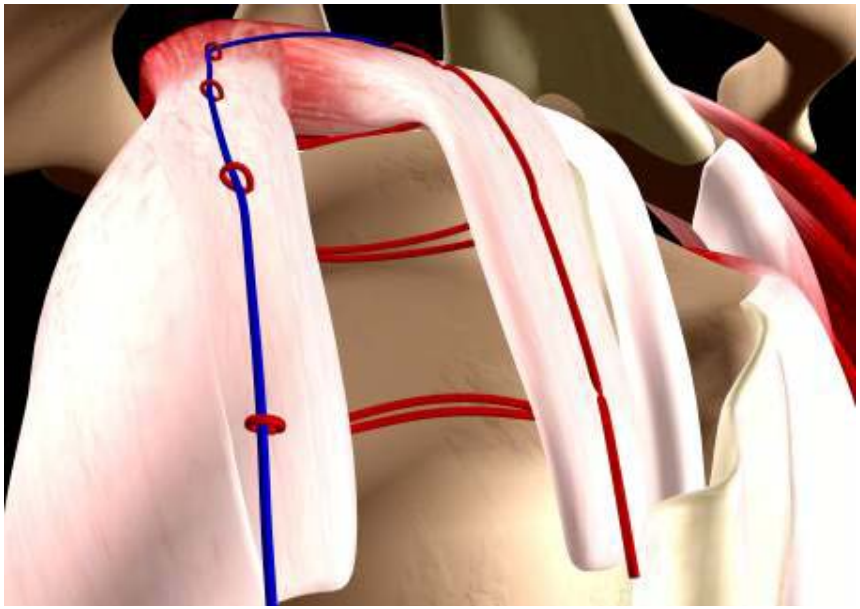
Video Release

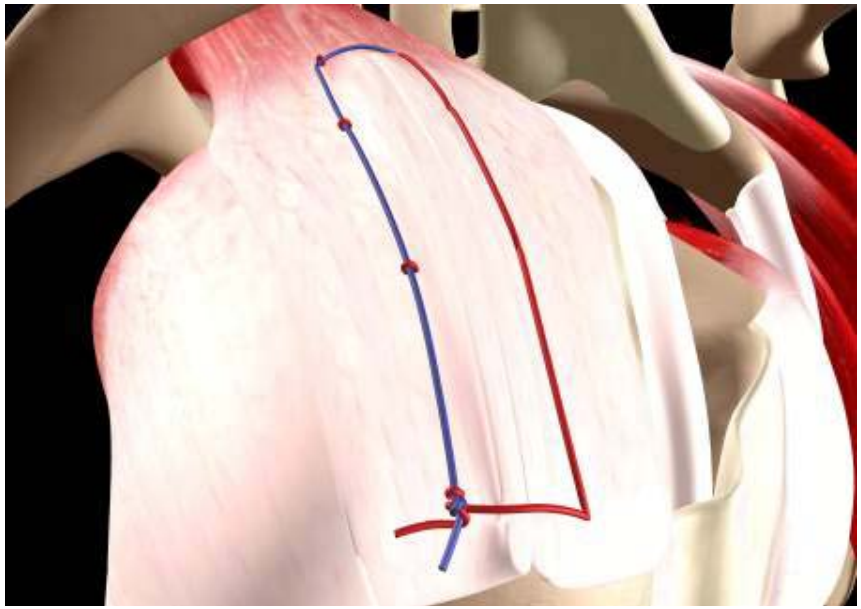
# Technique
# Double Row – Lasso Loop

- video

# Arthroscopic Assessment

- Side to Side Sawing Machine





# Technique
# Side to Side

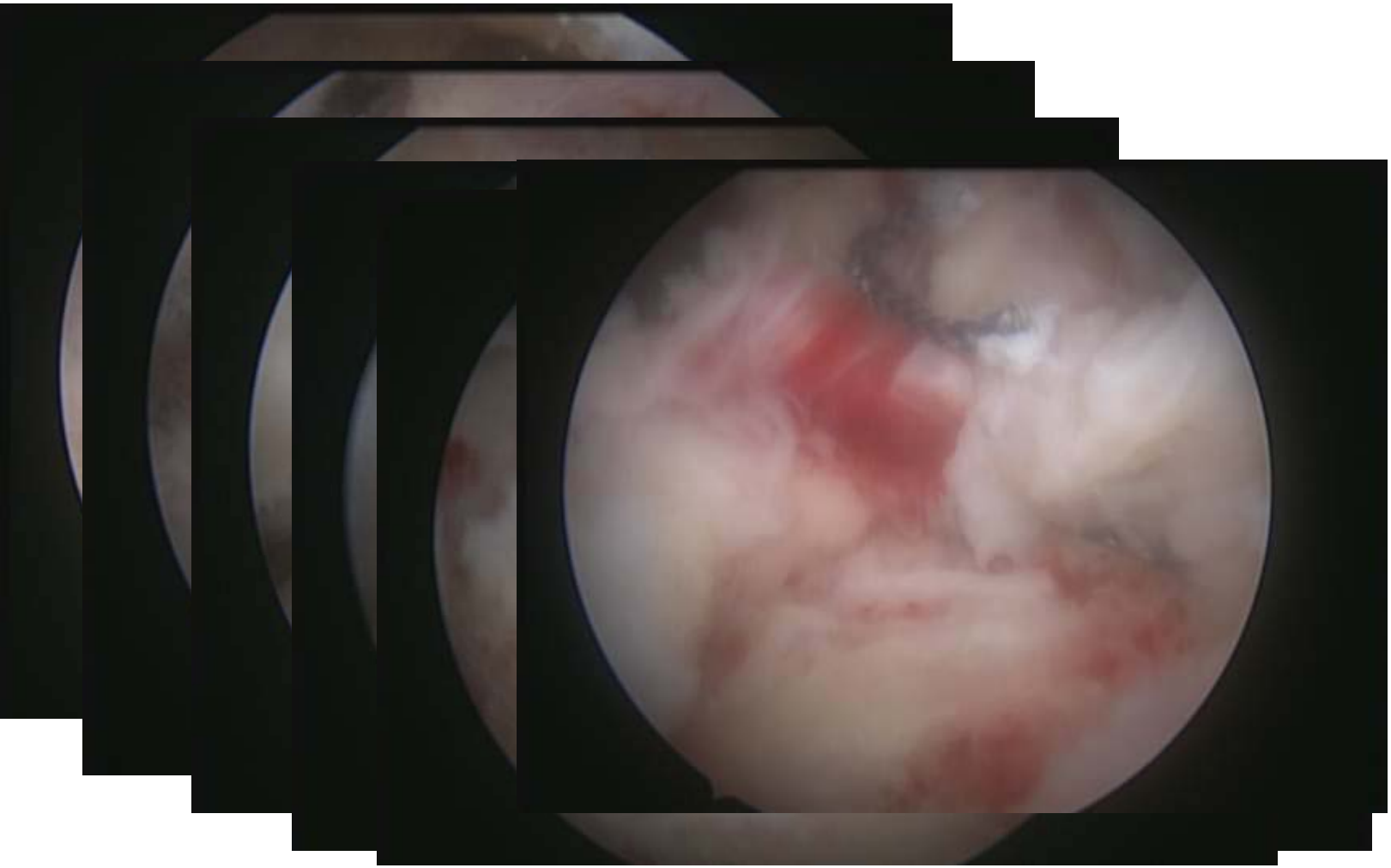
- video

# Irreparable Cuff Tear
# Single Row – Partial Repair

- video

# Irreparable Cuff Tear

- Partial Repair – Single Row



# AC-Resektion

Video

# Conclusion

- Single Row or Double Row are only tools
- ANALYSE of the lesion => adapted technique
- In order to
  RESTORE ANATOMY ⇔ good Result expected
- If impossible , partial repair vs tendon transfer can provide acceptable results